Communication modules can accordingly be attached on both sides of the display device. Therefore, at least three display devices can connect to each other side by side to communicate with each other and thus provide consistent display contents. Increase or decrease in number of the display devices is possible by connection and disconnection thereof as required.

According to an aspect of the invention, if the display device is newly coupled to or decoupled from other display devices, the coupling unit, the communication unit and the controller automatically inform all the display devices as to coupling or decoupling thereof when the coupling or decoupling is made.

Since the coupling and decoupling status can thus be conveyed to all display devices automatically, the display devices can all recognize which display device is coupled currently and thus can correctly designate a particular device to which control instructions should be transmitted. Further, when consecutive data are to be displayed in order by a plurality of coupled display devices respectively, the subsequent data can be displayed properly as the accurate number of coupled devices is known in real time.

According to another aspect of the invention, when the display device is rotated to be coupled to another display device by the coupling unit, the display unit rotates display contents and the controller changes its function to establish agreement between location and direction before rotation and those after rotation.

When the display device is rotated to be coupled to another display device, contents displayed on the display unit are rotated and the function of each input unit is changed to make agreement between the location and direction before rotation and those after rotation. Therefore, the resultant display status is natural for the user to enable the user to operate the device conveniently.

The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram illustrating a display device in one embodiment of the invention.

FIG. **2**A illustrates an exterior view of the display device and FIG. **2**B illustrates a coupling unit.

FIG. **3** illustrates an operation unit implemented by a software menu.

FIG. **4** illustrates two display devices coupled at 180°.

FIG. **5** illustrates two display devices coupled at 90°.

FIG. **6** illustrates the display device with an infrared communication module incorporated therein.

FIGS. **7**A to **7**C illustrate display devices coupled at various angles with respective infrared communication modules arranged accordingly.

FIGS. **8**A and **8**B illustrate improvements of FIGS. **7**A to **7**C.

FIGS. **9**A and **9**B illustrate display devices coupled face to face.

FIGS. **10**A and **10**B illustrate another method of implementing the coupling unit.

FIG. **11** illustrates communication units implemented by using infrared communication modules and a waveguide.

FIG. **12** illustrates three display devices connected side by side.

FIG. **13** illustrates display devices coupled to each other, each having communication modules on all of its four sides.

FIG. **14** is a flow chart illustrating details of processing by the display device.

FIG. **15** illustrates a data protocol communicated through communication units.

FIG. **16** is a flow chart illustrating details of step **S7** in FIG. **14**.

FIG. **17** is a flow chart illustrating details of step **S19** in FIG. **16** FIGS. **18**A to **18**G illustrate a plurality of display devices coupled to each other which display consecutive data in a manner shown.

FIG. **19** illustrates details of step **S23** in FIG. **16**.

FIGS. **20**A and **20**B illustrate display devices coupled to each other in a manner shown.

FIG. **21** illustrates processing concerning a communication history list.

FIG. **22** is a flow chart illustrating a connection check command transmitted by the display device.

FIG. **23** is a flow chart illustrating an operation of a data acquiring unit.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The embodiments of the present invention are hereinafter described in conjunction with the drawings.

Referring to FIG. **1** illustrating a display device, a data acquiring unit **1** acquires data. The data thus acquired is transmitted to a controller **4**. A display unit **2** displays the data obtained from controller **4**. An operation unit **3** conveys an input operation done by the user or the like to controller **4**. Controller **4** controls data acquiring unit **1**, display unit **2**, an inter-device communication unit **5** and a coupling unit **6**. It is noted "control" here includes communication of data. Inter-device communication unit **5** communicates with another display device coupled thereto. Coupling unit **6** establishes a structural coupling to another display device Data acquiring unit **1** can be implemented by using a memory and a magnetic recording device provided within the display device. It may alternatively be implemented by using media and drive such as memory card and CD-ROM detachable from the display device. It may also be implemented by a method of using a communication interface such as modem and Ethernet in order to acquire data on an external server through the communication interface. Further, as another method of implementing data acquiring unit **1**, inter-device communication unit **5** may be used as a communication interface so as to acquire data from a display device with which communication is made. Details of communication and an operation of data acquiring unit **1** will be described respectively in conjunction with FIG. **15** and FIG. **22**.

FIG. **2**A illustrates an external view of a display device **100** according to the present invention. Referring to FIG. **2**A, display unit **2** of display device **100** can be implemented as a flat display such as liquid crystal display and plasma display. CRT may alternatively be used. Display unit **2** displays data obtained from controller **4**. The data displayed is the one which has been developed on a memory or the like by controller **4** according to the display size and the number of colors of display unit **2**. Suppose that display unit **2** is 800×600 in size and a gray representation with 256 gradations is possible on display unit **2**, for example. One byte of data is required to display one pixel and accordingly data of 800×600=480,000 bytes in total are required. The data are